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(71) Applicant and

(72) Inventor: HA, Jeon Ho [KR/KR]; 202-304 Dongsin 2nd  
Apt., Junghwasan1-dong,, Wansan-gu, Jeonju-city,, Jeon-  
buk 560-251 (KR).

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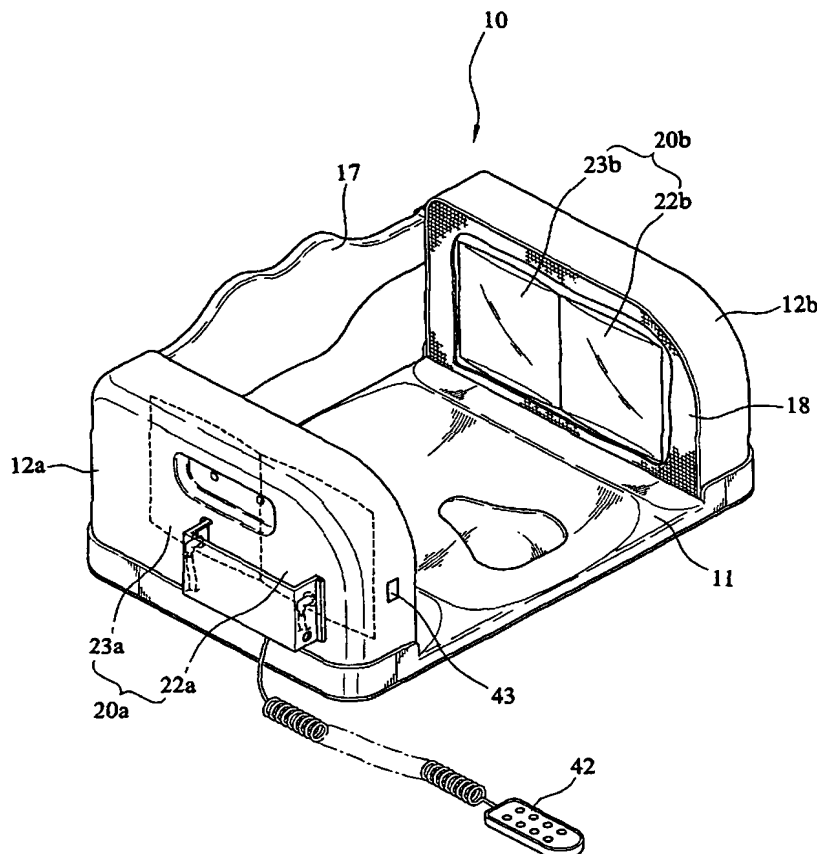
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(54) Title: PELVIS REMEDIAL SEATED DEVICE AND CONTROL METHOD THEREOF



(57) Abstract: The present invention relates to a pelvis remedial seated device and a control method thereof for remedying into its original place a women's widened pelvis after child birth. The pelvis remedial seated device is comprised of a seat (10) included a seat cushion (11) on which an occupant is to be seated and left/right seat sides (12a, 12b) provided uprightly at each side end of the seat cushion (11); a pair of air bags (20a, 20b) nested on an inner side of each side for enabling themselves to be expanded or contracted by air supplied into or discharged from the inside of the air bag; and air injection means for providing air pressure to the air bags (20a, 20b); wherein the expanding air pressure in the air bags presses the pelvis portion of an occupant. According to the present invention, the air pressure can artificially press the pelvis portion of the woman with seated or lying down relaxedly without constraining the human body so that rapid the pelvis remedy can be attained.

WO 2004/023970 A2

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PELVIS REMEDIAL SEATED DEVICE AND CONTROL METHOD THEREOFTechnical Field

5           The present invention relates to a pelvis remedial seated device for  
remedying into its original place a women's widened pelvis after child birth. More  
particularly, the invention relates to a pelvis remedial seated device and a control  
method thereof wherein the air pressure can artificially press the pelvis portion of  
10       body so that the woman can get into good shape as soon as it possible.

Background Art

15           As a woman grows older, the muscle of her pelvis is gradually weakened  
with cause of sexual life and child delivery. After the birth, particularly the pelvis  
muscle, which supports hypogastrium, the bladder, the vagina and the anus, takes a  
sudden turn for worse.

          The typical actual phenomena of the physical process occurred by following  
is that the pelvis gets wider. With the widened pelvis, the body of the woman loses a  
20       balance and it will not be able to maintain a good shape.

          Additionally, as the pelvis muscle weakens, the function that controls the  
bladder decreases. Even when the bladder is full, urinary incontinence can result in  
spite of oneself.

25           Another phenomena occurred by pelvis base muscular weakening is that the  
controllability of the sphincter, which contracts and dilates the vagina and the anus  
notedly decreases, thus bring an impediment to a married life.

          In many conventional arts, a guard belt having a form of a band is disclosed,  
which is worn on a waist or pelvis portion to support a weaken pelvis muscle. The  
typical prior technology describing the guard belt is cited in Korean Utility Patent  
30       No. 20-0166329.

The conventional guard belt is comprised of an inner band having a plurality of steel balls therein and an outer band covering the inner belt. It anticipates an action and effect such that a press of steel balls supports the articular ligament of the lumbar vertebra.

5           However, since conventional guard belts described above are worn using a Velcro (an adhesive tape which is substituted for a button: trademark) fastener attached on each free end of the belt, wearing the guard belt cause localized pressure in the human body and induces a pain. It also brings about a hindrance in activity of the body.

10           Further, as a wearer is doing an action, the tightening force gradually becomes loose and it must be tightened frequently, which brings a cumbersome problem. Furthermore, the inconvenience is brought that the wearer on a pelvis portion could not sit and lie down relaxedly.

15           Particularly, the conventional belt with its form of band has a weak pressure force and therefore not much effect can be anticipated. When a pelvis is crooked, it has a disadvantage that no appropriate remedy can be achieved.

#### Disclosure of the Invention

20           Accordingly, the present invention has been made with taking the above problems occurring in the prior art into consideration, and an object of the present invention is to provide a pelvis remedial seated device and a control method thereof in which the air pressure can smoothly press the pelvis portion of a woman while seated or lying down relaxedly, with good usability and moderation to the human  
25           body, and also a widened pelvis of woman after the birth is returned into its original place so as to maintain a good shape, and further the feminine function decrease and the disease caused by the widened pelvis can effectively be cured.

30           Another object of the present invention is to provide a pelvis remedial seated device and a control method thereof in which air pressure supplied to respective air bags can be regulated according to human's contour, and the pelvis can be pressed in a predetermined level irrespective of human's contour.

Another object of the present invention is to provide a pelvis remedial seated device and a control method thereof in which front and rear air bags installed at each right and left side can be expanded or contracted crosswise, and a crooked pelvis can be remedied by applying pressure to the pelvis diagonally.

5 Another object of the present invention is to provide a pelvis remedial seated device and a control method thereof in which air pressure can be applied in various levels and the pelvis can be remedied using various modes such as massage, fumble with pressing, and beat.

10 In order to accomplish the above object, a pelvis remedial seated device comprises a seat included a seat cushion on which an occupant is to be seated and a left/right seat side provided uprightly at each side end of the seat cushion; a pair of air bags nested on an inner side of each side for enabling themselves to be expanded or contracted by air supplied into or discharged from the inside of the air bag; and air injection means for providing air pressure to the air bags; wherein the expanding  
15 air pressure in the air bags presses the pelvis portion of an occupant.

Further, the pair of air bags are comprised of front/rear cells having an individual space; the air injection means is comprised of right/left air pump each connected to the right/left air bag for supplying the air into the front/rear cells, right/left direction control valve for supplying air to all air bags or a selective one,  
20 right/left air pressure sensor for detecting the pressure of the air fed into the right/left direction control valve from the right/left air pump, right/left front/rear air discharge valve for discharging the air from the front/rear cells, controller for controlling the air pump, direction control valve and air discharge valve, a display panel for displaying a signal generated from the controller, and a control panel having a  
25 plurality of operating keys for inputting the signal generated by a pushed key into the controller.

Furthermore, the seat cushion has further a photo detective sensor, and during no occupant's seating, the photo detective sensor senses the light and the running of the remedial seated device is stopped by the command of the controller.

30 Further, the seat cushion has further a far-infrared generator, an oscillating motor and a low frequency oscillator controlled by the command of the controller at

the contacting portion with an occupant's hip, by which the far-infrared light is applied to a pelvis muscle.

A control method of a pelvis remedial seated device is comprised the steps of:

5 (A) inputting a value of a press level chosen by an occupant through a control panel;

(B) supplying the air into right/left air bag by operation of right/left air pump;

10 (C) supplying the air into left front/rear cells and right front/rear cells under the control of right/left direction control valves;

(D) detecting the air pressure in right/left air bags by right/left air pressure sensors, determining whether a detected air pressure is lower than a value inputted by an occupant, returning to step (B) if it is, or stopping a running of the air pump for predetermined period if it is not;

15 (E) discharging the air through opened right/left front/rear air discharge value until the air pressure of the air bag is lower than a discharge pressure; and,

(F) stopping the running of the air pump for predetermined period when the air pressure of the air bag is lower than a discharge pressure, comparing between the present time elapsed from step (A) and the predetermined set time, returning to step 20 (B) if the present time has not passed, or going a stop step if it has.

A control method of the remedial device to remedy a crooked pelvis is comprised the steps of:

(A) inputting a value of a press level chosen and a type of crook remedy by an occupant through a control panel;

25 (B) supplying the air into right/left air bag by operation of right/left air pump;

(C) supplying the air into left front/rear cells and right front/rear cells under the control of right/left direction control valves;

30 (D) detecting the air pressure in right/left air bags by right/left air pressure sensors, determining whether a detected air pressure is lower than a value inputted

by an occupant, returning to step (B) if it is, or determining whether its next step is a right crook remedy or a left crook remedy if it is not;

(E) discharging the air through a left rear air discharge value and a right front air discharge value until the air pressure of a left rear cell and a right front cell is the appropriated one to support an occupant's pelvis when the left crook remedy;

(F) determining whether the air pressure of the left rear cell and the right front cell is lower than a discharge one, returning to step (E) if it is not, stopping the running of the air pump for predetermined period if it is;

(G) comparing between the present time elapsed from step (A) and the predetermined set time, returning to step (B) if the present time has not passed, or going a stop step if it has;

(H) discharging the air through a left front air discharge value and a right rear air discharge value until the air pressure of a left front cell and a right rear cell is the appropriated one to support an occupant's pelvis when the left crook remedy at step (D); and,

(I) determining whether the air pressure of the left front cell and the right rear cell is lower than a discharge one, returning to step (H) if it is, stopping the running of the air pump for predetermined period if it is not, and comparing between the present time elapsed from step (A) and the predetermined set time, returning to step (B) if the present time has not passed, or going a stop step if it has.

#### Brief Description of the Drawings

The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1A is a perspective view of a pelvis remedial seated device according to one embodiment of the present invention;

FIG. 1B is a perspective view of a pelvis remedial seated device according to other embodiment of the present invention;

FIG. 2 is a sectional view showing the inner construction of a seat cushion according to the present invention;

FIG. 3 is a sectional view showing an installation of an air bag;

FIG. 4 is a top plan view illustrating an installation of a photo detective sensor and far-infrared generator on a seat cushion;

FIG. 5 is a side view of a chair on which the seat is placed;

FIG. 6 is a front view of a chair by which the width between the right/left seat side can be adjusted according to an occupant's physical size;

FIG. 7 is a block diagram illustrating an air injection and its accompanying device according to the present invention;

FIG. 8A, 8B are top plan views illustrating state of air-injecting to either a front cell or rear cell of a right/left air bag;

FIG. 9 is a view showing one embodiment of a display panel and a control panel employed at an air injection means;

FIG. 10 is a timing chart illustrating that the inventive remedial device controls operation of the right/left direction control value and the front/rear air discharge value;

FIG. 11 is a flow chart illustrating a control method in which the remedial device is operated as a "massage" function;

FIG. 12A, 12B are top plan views illustrating air injection and discharge into/from front/rear cell diagonally; and

FIG. 13 is a flow chart illustrating a control method of the remedial device to remedy a crooked pelvis.

## Best Mode for Carrying Out the Invention

This invention will be described in further detail by way of exemplary embodiments with reference to the accompanying drawings.

As shown in Figs. 1A and 1B, the inventive pelvis remedial seated device is fundamentally comprised of a seat 10 on which an occupant's hip rests, a pair of air bags 20a, 20b nested at an inner side of the seat 10 and air injection means for



providing air pressure to the air bags 20a, 20b. Hereafter, right side of an occupant is designated as "a" and left side of an occupant is designated as "b" for convenience of description.

5 The seat 10 has a seat cushion 11 on which an occupant is to be seated and right/left seat sides 12a, 12b provided uprightly at each side end of the seat cushion 11. The right/left seat sides 12a, 12b maintain the expanding pressure of the air bags 20a, 20b as an occupant's pelvis portion is pressed by the expanded air bags 20a, 20b.

10 The seat cushion 11 and the right/left seat sides 12a, 12b, as shown in Figs. 2 and 3, are configured as a hollow by plural partitions 14 which are erected in a constant space, and the bottom of the seat cushion 11 is covered by a bottom plate 15 which is demountably screwed to the cushion.

15 In the inner space of the seat 10, components of an air injection means, a photo detective sensor 39, a far-infrared generator "I", and an oscillating motor "M" which are described hereafter are accommodated.

The photo detective sensor 39, as illustrated in Fig. 4, is exposed at the top of the seat cushion 11, and is detected the light when no occupant is seated. Thus, the operation of the inventive remedial device should be stopped by the command of a controller 35 explained next, thereby eliminating an unnecessary working.

20 The far-infrared generator "I", as shown in Fig. 4, is installed at an inner portion of the seat cushion 11, which contacts with an occupant's hip. The far-infrared is applied to a pelvis of an occupant, thereby obtaining an effect of fomentation to the pelvis. It will prevent various diseases caused by a cold pelvis.

25 The oscillating motor "M" and the far-infrared generator "I", as shown in Fig. 1B, are mounted on the seat cushion 11 so as to stimulate an occupant's hip and get a maximum effect of the contraction of a pelvis. The oscillating motor "M" and the far-infrared generator "I" generate the delicate, refined rhythm to enable the movement of a body's nervous system and the blood flow to become more smooth, thereby leading to the acceleration of metabolism. That is, these electronic devices  
30 provide the physical stimulation to maintain a control of body's function and a balance of biologic tissue.

In Fig. 1B, an outlet is provided at a bottom of a front edge of the right seat side 12a, while the display panel 36 and the control panel 37 are provided at a top of a front edge of the right seat side 12a. The outlet might be installed at another place, and the panels 36, 37 can be installed at a wire controller 42 or wireless remote controller (not shown) as shown Fig. 1A. That is, the wire controller 42 can be connected to the right seat side 12a so that an occupant can easily manipulate key pads of the control panel, otherwise, a signal input window 43 can be installed at the right seat side 12a so that an occupant can use a wireless remote controller.

A first seat back 17 is demountably provided at the rear of the right/left seat side 12a, 12b (Fig. 1A). When a seating position of an occupant, the first seat back 17 is attached to support the back of an occupant, while when a lying down position of an occupant, the first seat back 17 can be separated from the seat 10. As shown in Fig. 1A, the first seat back 17 can be mounted at the rear of the right/left seat sides 12a, 12b, otherwise, as shown Fig. 2, the first seat back 17 can be inserted into a slot 16 formed at the rear rim of the seat cushion 11.

In the seat cushion 11, a concaved groove (Fig. 1A) is shaped, and when the air bags 20a, 20b press an occupant's pelvis, the hip of an occupant can be moved toward inside of the seat cushion and it contributes a maximum contraction of a pelvis.

At the central portion of the right/left seat sides 12a, 12b, as shown in Figs. 1B to 3, provides a through-hole with which an air nozzle pipe 21 placed in the right/left seat sides 12a, 12b connects the air bags 20a, 20b with the right/left air pumps 31a, 31b. One free end of the air nozzle pipe 21 is secured in a square opening formed around the though-hole.

A flexible fabric 18 is installed round the edge of the right/left seat sides 12a, 12b to place the air bags 20a, 20b in their position. The flexible fabric 18 is expanded or contracted owing to the operation of the air bags 20a, 20b nested between the flexible fabric 18 and the inner side of the right/left seat sides 12a, 12b. Along the exterior of the right/left seat sides 12a, 12b, a rim cover 19 is provided to shield a fringe of the flexible fabric 18.

A pair of air bags 20a, 20b installed in the right/left seat sides 12a, 12b receive the air from the air injection means to be expanded, or release the air from the air bags to be contracted, thus give a pressure to a pelvis. High strength vinyl bag can be employed as the air bag. A portion of the seat sides corresponding to an occupant's pelvis is independently divided into a front/rear cells 22a, 22b, 23a, 23b.

In this invention, a plural of rubber pads 40 are further provided at the exterior of the right/left air bags 20a, 20b. The rubber pads 40 will be used to properly adjust the pressure against the femoral region depending on an occupant's contour. For instance, a woman who has a smaller pelvis than normal size can employ plural rubber pads to increase the pressure to her femoral region.

Further, this invention provides a chair 50 on which the seat 10 is placed that can be used as a usual chair. The chair 50, as shown in 5, is comprised of a support plate 51 on which the rim of the seat cushion 11 is tightly nested, a second seat back 52 provided uprightly at the rear portion of the support plate 51 and legs 53 extended down from the support plate 51. The chair can be adapted as shown in Fig. 6, by which the width between the right/left seat sides 12a, 12b can be adjusted according to an occupant's physical size.

In this embodiment, the seat cushion 11 and the right/left seat sides 12a, 12b are detached from each other, and a rail 61 is transversely installed at the central bottom of the seat cushion 11. At each end of the rail 61 is provided in a transversal movement a pair of angular connector 62 which is fixed to the right/left seat sides 12a, 12b. Legs 66 are installed at the central bottom of the rail 61. Plural jaws 63 are formed at the bottom of the angular connector 62 in an even interval. Further, at longitudinal slot (not shown) are installed a pair of stoppers which can be pressed by a spring 64. Therefore, the width between the right/left seat side 12a, 12b can be adjusted to fit an occupant's physical size, and the stopper 65 restricts the jaws 63 so as not to move the right/left seat sides 12a, 12b.

Fig. 7 is a block diagram illustrating an air injection means and accompanying apparatus according to the invention. The air injection means is comprised of right/left air pumps 31a, 31b each connected to the right/left air bags 20a, 20b for supplying the air into the front/rear cells 22a, 22b, 23a, 23b, and

right/left direction control valves 32a, 32b for supplying air to all air bags 20a, 20b or a selective one. Further, the air injection means is comprised of right/left air pressure sensors 38a, 38b for detecting the pressure of the air fed into the right/left direction control valves 32a, 32b from the right/left air pumps 31a, 31b, and right/left front/rear air discharge valves 33a, 33b, 34a, 34b for discharging the air from the front/rear cells 22a, 22b, 23a, 23b. Furthermore, the air injection means is comprised of a controller 35 for controlling the air pumps 31a, 31b, direction control valves 32a, 32b and air discharge valves 33a, 33b, 34a, 34b, a display panel 36 for displaying a signal generated from the controller 35, and a control panel 37 having a plurality of operating keys for inputting the signal generated by a pushed key into the controller 35.

With this configuration, the air supplied from the right/left air pumps 31a, 31b is injected into the right/left directional valves 32a, 32b. Since left air pressure sensor 38b is installed between the left air pump 31b and the left directional valve 32b, the air pressure supplied into the left control valve 32b from the left air pump 31b can be detected and the signal value of the detected air pressure is sent to the controller 35. Similarly, since the right air pressure sensor 38a is installed between the right air pump 31a and the right directional valve 32a, the air pressure supplied into the right control valve 32a from the right air pump 31a can be detected and the signal value of the detected air pressure is sent to the controller 35.

The controller 35 receives the signal of air pressure detected by the air pressure sensors 38a, 38b and compares it with a pressure level which is inputted through the control panel 37 by an occupant. After a comparison, if the detected pressure value is larger than a predetermined set value, the operation of the air pumps 31a, 31b is stopped and no more air is injected into the air bags 20a, 20b.

Under a command of the controller 35, the right/left direction control valves 32a, 32b supplies or relieves the air into/from the front/rear cell 22b, 23b of the left air bag 20b and the front/rear cells 22a, 23a of the right air bag 20a.

When the left direction control valve 32b supplies the air into the front cell 22b of the left air bag 20b, the front cell of the left air bag 20b is expanded to apply a press to the left front portion of a pelvis. Similarly, when the left direction control

valve 32b supplies the air into the rear cell 23b of the left air bag 20b, the rear cell of the left air bag 20b is expanded to apply a press to the left rear portion of a pelvis.

The operation of the left side as explained above will be adapted to the right direction control valve 32a and the right air bag 20a of the right side. Therefore, with the control of the left direction control valve 32b, the air can supply either front cell 22b or rear cell 23b of the left air bag 20b selectively; in the same manner, with the control of the right direction control valve 32a, the air can supply either front cell 22a or rear cell 23a of the right air bag 20a selectively.

To enable the remedial device to be operated as massage function, as shown in Figs. 8A and 8B, the air can be supplied either both of front cells 22a, 22b or both of rear cells 23a, 23b of the right/left air bags 20a, 20b simultaneously or the supply of the air can be interrupted. When the air is supplied into the front cells 22a, 22b of the right/left air bags 20a, 20b simultaneously, a front portion of pelvis is pressed, whilest when the air is supplied into the rear cells 23a, 23b of the right/left air bags 20a, 20b simultaneously, a rear portion of pelvis is pressed. As the air is supplied or relieved into/from the front/rear cells 22a, 22b, 23a, 23b alternately for a predetermined time period, the effect of pelvis massage and pelvis remedy can be achieved.

The level of air pressure supplied into the right/left air bags 20a, 20b categorizes into three such as "high", "medium" and "low" by the control of level key pads provided on the control panel 37. For instance, "high" can be set to  $290 \pm 10$  mmHg, "medium" can be set to  $230 \pm 10$  mmHg and "low" can be set to  $140 \pm 10$  mmHg. Even when the air discharge from the air bags 20a, 20b, the value of pressure dose not need to be set to "0", and "high" may be set to  $180 \pm 10$  mmHg, "medium" may be set to  $150 \pm 10$  mmHg and "low" may be set to  $90 \pm 10$  mmHg. Therefore, the value of pressure can be maintained to support a pelvis of an occupant even when the air is discharged from the air bags 20a, 20b.

In the inventive remedial device, as the operation of the right/left direction valves 32a, 32b and the front/rear discharge valves 33a, 33b, 34a, 34b can be made a combination and many modes, such as front press, rear press, front/rear

simultaneous press, front/rear crossing press, and expansion/contraction repeating press, etc. can be performed.

The far-infrared generator "I", the low frequency oscillator "F" and an oscillating motor "M" are installed at the bottom of the seat cushion 11 as explained above. The operation of these devices can combine with the working of the air bags 20a, 20b to achieve pelvis remedy in various modes. For example, the 'fumble with pressing' effect can be attained at the low frequency oscillator "F" with 'fumble with pressing' mode, and at the same time, all portion of pelvis can be massaged by the repeated press and release using the front/rear cells 22a, 22b, 23a, 23b.

Fig. 9 illustrates one embodiment of the display panel 36 and the control panel 37 employed at the pelvis remedial device. The display panel 36 performs a function for displaying a signal generated from the controller 35, and the control panel 37 has a plurality of operating keys for inputting the corresponding signal generated by a pushed key into the controller 35.

The display panel 36 is comprised of a timer unit 36a indicating the running duration of the remedial device, a level indicating unit 36b for displaying the level of a chosen function and a function indicating unit 36c for displaying which function an occupant choose.

The control panel 37 is comprised of plural function key pads 37a for selecting an adaptable function such as "massage", "beat", and "fumble with pressing", a pair of level key pads 37b for setting the level of a function chosen, plural mode key pads 37c for choosing various mode, a time set key pad 37d for setting a running duration of the chosen function or the mode and a power key pad 37e for turning on/off power.

An occupant pushes the power key pad to apply the power to the device, and a default set time is displayed on the timer unit 36a, and also a value of a level chosen previously is shown on the level indicating unit 36b. When an occupant presses the "massage" key among the function key pads 37a, a signal corresponding to "massage" function is sent to the controller 35 from the control panel 37.

Under a command of the controller 35, a character "massage" is shown on the function indicating unit 36c, and a default time is displayed on the timer unit

36a, and the level of the chosen function is presented on the level indicating unit 36b. With a command of the controller 35, the right/left air pumps 31a, 31b supply the air into the front/rear cells 22a, 22b, 23a, 23b of the right/left air bags 20a, 20b. The air pressure supplied to the cells can be adjusted by the level key pads 37b.

5           The air pressure supplied to the cells 22a, 22b, 23a, 23b of the air bags 20a, 20b is established as 10 levels between 50~500 mmHg, and each level value has 50 mmHg. That is, first level corresponds to 50 mmHg, and second level corresponds to 100 mmHg, third level corresponds to 150 mmHg, ..., and tenth level corresponds to 500 mmHg.

10           An occupant can select one function, such as "massage", or "beat", or "fumble with pressing" among the function key pads 37a. During running of the device, however, if a weakening air pressure is felt, an occupant presses a "↑" key pad of, indicating an ascend of an air pressure, the level key pads 37b, and an air pressure having one level higher than a present pressure value is supplied to the cells  
15 of the air bags 20a, 20b. While still pressing the "↑" key pad, the level increases up to the tenth level, in which the time between each one level increase can be set at 5 seconds.

          A state of air pressure value is displayed on the level indicating unit 36b. In this embodiment, if the chosen value of air pressure is 150 mmHg, three bars are  
20 shown on the level indicating unit 36b. When pressing the "↑" key pad to increase one level, the four bars are shown on the level indicating unit 36b. Similarly, a descent "↓" key pad is pressed one time and one level is decreased. While still pressing the "↓" key pad, each bar is eliminated per 5 seconds, finally one level is arrived.

25           After an occupant selects the function by pressing on one key among the function key pads 37a, a running duration is selected by pressing the time set key pad 37d. When choosing the function for the first time, for example, "0" is displayed on the timer unit 36a. A value corresponding to 1 minute is shown on the timer unit 36a as the timer set key pad 37d is pressed one time. One minute is added to the  
30 existed value in proportion to press count of the time set key pad 37d. While still

pressing the time set key pad 37d, the displaying value increases up in a predetermined speed (e.g. 1 minute per 1 second).

Further, with the mode key pads 37c, four modes can be chosen, in which a combination of "massage", "beat", "fumble with pressing" can be accomplished in constant pattern. If "M1" is a mode repeating "massage", "beat", "fumble with pressing", when an occupant presses "M1", the front/rear cells 22a, 22b, 23a, 23b are expanded or contracted repeatedly in a constant pattern, thus achieving a repeating function of "massage", "beat", "fumble with pressing".

Fig. 10 is a timing chart illustrating that the inventive remedial device controls operation of the right/left direction control value and the front/rear air discharge value. At time  $t_0$ , power is applied to the right/left air pumps 31a, 31b, and the air is supplied to the front/rear cells 22a, 22b, 23a, 23b from the air pumps 31a, 31b. After that, the front path of the right/left direction control valves 32a, 32b is opened for the air to feed into the front cells 22a, 22b. Since the right/left front air discharge valves 33a, 33b is closed and the right/left rear air discharge valves 34a, 34b is opened, the front cells 22a, 22b is expanded, thus pressing the front portion of the pelvis.

At time  $t_1$ , under a command of the controller 35, since the right/left direction valves 32a, 32b opens its rear path, and closes its front path, the air is supplied to the rear cells 23a, 23b. Since the right/left front air discharge valves 33a, 33b maintain its closed state, and the right/left rear air discharge valves 34a, 34b are closed, the front/rear cells 22a, 22b, 23a, 23b are expanded, thus pressing the front/rear portion of the pelvis.

At time  $t_2$ , in the right/left directional valves 32a, 32b, its rear path is still opened, and its front path is continually closed, and thus the air is still supplied to the rear cells 23a, 23b. Since the front air discharge valves 33a, 33b are opened, the air is discharged from the right/front cell 22a. With the state of the pressure release against the front portion of a pelvis, the rear air discharge valves 34a, 34b are still closed and the rear cells 23a, 23b maintain its expansion state, thus pressing the rear portion of the pelvis.



At time  $t_3$ , the right/left directional valves 32a, 32b supply the air to the rear cells 23a, 23b still, and since the front air discharge valves 33a, 33b are being opened, but the front path is still closed, the air is not supplied to the front cells 22a, 22b, thus no pressing is applied to the front portion of the pelvis. Since the rear air discharge valve is still closed, the rear cells 23a, 23b maintain its expansion state, thus continuing the pressing to the rear portion of the pelvis.

At time  $t_4$ , under a command of the controller 35, since the right/left directional valves 32a, 32b open its front path to supply the air to the front cells 22a, 22b, and close its rear path, the air is not supplied to the rear cells 23a, 23b. Since the front air discharge valves 33a, 33b as well as the rear air discharge valves 34a, 34b maintain their closed state, the front cells 22a, 22b stay in the air supply state, and the rear cells 23a, 23b are expanded, thus pressing the front/rear portion of the pelvis.

At time  $t_5$ , under a command of the controller 35, the right/left directional valves 32a, 32b still open its front path, but no power is applied to the air pumps 31a, 31b, and the air is not supplied to the front cells 22a, 22b. Also, since the rear path is closed, no air is supplied to the rear cells 23a, 23b. At this time, the front/rear air discharge valves are still closed, and the front/rear cells 22a, 22b, 23a, 23b maintain their expansion state, thus pressing continuously the front/rear portion of the pelvis.

At time  $t_6$ , the air pumps 31a, 31b and the right/left directional valves 32a, 32b maintain their previous state, but the front/rear air discharge valves 33a, 33b, 34a, 34b are opened, and the air is discharged from each front/rear cell 22a, 22b, 23a, 23b, thus releasing the pressing against the pelvis.

Fig. 11 is a flow chart illustrating a control method in which the remedial device is operated as a "massage" function. After the power is applied, a value of press level chosen by an occupant is inputted through the control panel (step S41), the right/left air pumps 31a, 31b are operated and the air is supplied into the right/left air bags 20a, 20b (step S42), the right/left directional valves 32a, 32b are controlled and the air is supplied into each front/rear cell 22a, 22b, 23a, 23b (step S43).

The air pressure of the air bags 20a, 20b is detected by the air pressure sensors 38a, 38b, and the controller determines whether the detected air pressure is lower than a value set by an occupant, and if it is, returns to step S42. If it is not, goes to next step S45 (step S44). At step S45, a running of the air pumps 31a, 31b is stopped for predetermined period (e.g. 10 seconds) and the air pressure of the air bags 20a, 20b can be maintained as the setting value. At step S46, the front/rear air discharge valves 33a, 33b, 34a, 34b are opened and the air is discharged until the air pressure of the air bags 20a, 20b is lower than a discharge pressure.

At step S47, the controller determines whether the air pressure of the air bags 20a, 20b is lower than a discharge pressure, if it is not, returns to step S46. If it is, goes to next step S48. At step S48, the running of the air pumps 31a, 31b is stopped for predetermined period (e.g. 10 seconds). At step S49, the controller compares the present time elapsed from step S41 with the predetermined set time (e.g. 15 minutes). If the present time has not, returns to step S42. If it has, goes to stop step where the execution of the program is terminated.

As above, the injection and discharge operation into/from the front/rear cells 22a, 22b, 23a, 23b is repeated, thus attaining the effect of pelvis's massage.

When a pelvis is crooked, to remedy the crooked pelvis, a left/front portion and a right/rear portion of a pelvis are pressed, otherwise a right/rear portion and a left/front portion of a pelvis are pressed in opposite to the crooked direction. For example, when right portion of a pelvis is crooked backward and left portion of a pelvis is crooked forward, as shown in Fig. 12A, the air is supplied to the front cell 22b of the left air bag 20b and the rear cell 23a of the right air bag 20a, and the air is discharged to a predetermined pressure value from the rear cell 23b of the left air bag 20b and the front cell 22a of the right air bag 20a. Similarly, when left portion of a pelvis is crooked backward and right portion of a pelvis is crooked forward, as shown in Fig. 12B, the air is discharged to a predetermined pressure value from the front cell 22b of the left air bag 20b and the rear cell 23a of the right air bag 20a, and the air is supplied to the rear cell 23b of the left air bag 20b and the front cell 23a of the right air bag 20a.

Fig. 13 is a flow chart illustrating a control method of the remedial device to remedy a crooked pelvis. After the power is applied, the value of press level chosen and a type of crookedness remedy by an occupant is inputted through the control panel (step S61), the right/left air pumps 31a, 31b are operated and the air is supplied into the right/left air bags 20a, 20b (step S62), the right/left directional valves 32a, 32b are controlled and the air is supplied into each front/rear cell 22a, 22b, 23a, 23b (step S63).

The air pressure of the air bags 20a, 20b is detected by the air pressure sensors 38a, 38b, and the controller determines whether the detected air pressure is lower than a value set by an occupant; if it is, returns to step S62. If it is not, goes to next step S65 (step S64). At step S65, the controller determines whether a type of crookedness remedy is a right crookedness remedy or a left crook remedy. If it is the left remedy, the left/rear air discharge valve 34b and the right/front air discharge valve 33a are operated, and the air is discharged until the air pressure of the left/rear cell 23b and the right/front cell 22a is the appropriated one to support an occupant's pelvis (step S66). At step S67, the controller determines whether the air pressure of the left/rear cell 23b and the right/front cell 22a is lower than a discharge pressure, if it is not, returns to step S66. If it is, goes to next step S68. At step S68, a running of the air pumps 31a, 31b is stopped for predetermined period (e.g. 10 seconds). At step S69, the controller compares the present time elapsed from step S61 with the predetermined set time (e.g. 15 minutes). If the present time has not, returns to step S62. If it has, goes to stop step where the execution of the program is terminated.

Meanwhile, at step S65, if the determination is a left crookedness remedy, the left/front air discharge valve 33b and the right/rear air discharge valve 34a are operated, and the air is discharged until the air pressure of the left/front cell 22b and the right/rear cell 23a is the appropriated one to support an occupant's pelvis (step S70). At step S71, the controller determines whether the air pressure of the left/front cell 22b and the right/rear cell 23a is lower than a discharge pressure, if it is not, returns to step S70. If it is, goes to step S68 and follows the process.

Therefore, the air is supplied to the front cell 22b of the left air bag 20b and the rear cell 23a of the right air bag 20a, and the air pressure corresponding to a

selected level is applied. At the same time, the air is discharged from the front cell 23b of the rear air bag 20b and the front cell 22a of the right air bag 20a. Thus, the left pelvis is pressed backward and the right pelvis is pressed forward. As the result, the left forward crooked pelvis is pushed in a right forward direction, thus attaining the straightening effect.

Similarly, the air is supplied to the rear cell 23b of the left air bag 20b and the front cell 22a of the right air bag 20a, and the air pressure corresponding to a selected level is applied. At the same time, the air is discharged from the front cell 22b of the left air bag 20b and the rear cell 23a of the right air bag 20a. Thus, the right pelvis is pressed backward and the left pelvis is pressed forward. As the result, the right forward crooked pelvis is pushed in a left forward direction, thus attaining the straightening effect.

As the present invention is comprised of as above, it is very useful to contract the widened pelvis by pressing a woman's pelvis and curing the crooked pelvis. The widening of a pelvis caused by sexual life and birth can be cured to go back to an original condition such as a woman's pelvis in her twenties.

#### Industrial Applicability

According to the inventive pelvis remedial seated device and a control method thereof described above, the air pressure can be controlled as one's pleasures with seating or lying down relaxedly and the pelvis portion of a woman can be pressed smoothly in a continuous and repeated manner, which leads to good usability and moderation to the human body. Also, a widened pelvis of woman after the birth is returned to its original place so as to maintain a good shape as soon as it can.

Further, the present invention has an effect in that the pressure can be applied by the expansion and contraction of air bags, and various mode such as massage, beat and fumble with pressing can be selected, thus achieving the pelvis remedy promptly.

Further, the present invention has an effect in that when the detected pressure level of air bags become the predetermined level set by user, the air supply can be stopped, thus pressing the human irrespective of human's contour in a predetermined pressure level.

5 Further, the present invention has an effect in that a front or a rear cell of air bags provided at each right or left side can be expanded or contracted crosswise, and in the case of a crooked pelvis, the pressure can be applied in the opposite direction against the crookedness direction, thus enabling the crooked pelvis to be cured.

10 Additionally, the present invention has various practical uses for human's body remedy in that a knee of user can be put on a seat bottom and can be pressed, thus utilizing the remedy of splayed legs in a form of "O".

The prevent invention as above is the useful invention in which the feminine function decreases and the disease caused by the widened pelvis can effectively be cured.

15 Although preferred embodiments of the present invention have been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as defined in the accompanying claims.

Claims

1. A pelvis remedial seated device comprising:

5 a seat 10 included a seat cushion 11 on which an occupant is to be seated and left/right seat sides 12a, 12b provided uprightly at each side end of the seat cushion 11;

a pair of air bags 20a, 20b nested on an inner side of each side for enabling themselves to be expanded or contracted by air supplied into or discharged from the inside of the air bag; and,

10 air injection means for providing air pressure to the air bags 20a, 20b;

wherein the expanding air pressure in the air bags presses the pelvis portion of an occupant.

15 2. The pelvis remedial seated device as set forth in claim 1, wherein the seat has further a first seat back 17 demountably provided at the rear of the left/right seat sides 12a, 12b.

20 3. The pelvis remedial seated device as set forth in claim 1, wherein the seat has a concaved groove at the center thereof where the hips of an occupant is set.

4. The pelvis remedial seated device as set forth in claim 1, wherein a flexible fabric 18 is installed round the edge of each right/left seat side 12a, 12b, and each air bag 20a, 20b is nested between the flexible fabric 18 and the inner side of each right/left seat side 12a, 12b.

25 5. The pelvis remedial seated device as set forth in claim 1, wherein a plural of rubber pads 40, of which the number depends on an occupant's contour, are further provided at the exterior of each air bag 20a, 20b for increasing the pressure against the femoral region.

6. The pelvis remedial seated device as set forth in claim 1, wherein a chair 50 on which the seat 10 is placed is further provided, the chair 50 is comprised of a support plate 51 on which the rim of the seat cushion 11 is fixedly nested, a second seat back 52 provided uprightly at the rear portion of the support plate 51 and legs 53 extended down from the support plate 51.

7. The pelvis remedial seated device as set forth in claim 1, wherein the seat cushion 11 and the right/left seat sides 12a, 12b are detached from each other, and a rail 61 is transversely installed at the central bottom of the seat cushion 11 so that the each seat side 12a, 12b is slid along a longitudinal slot of the rail 61, by which a distance between the right/left seat side 12a, 12b can be adjusted according to an occupant's physical size.

8. The pelvis remedial seated device as set forth in claim 7, wherein legs 66 are installed at the central bottom of the rail 61.

9. The pelvis remedial seated device as set forth in claim 1, wherein the pair of air bags 20a, 20b are comprised of front/rear cells 22a, 22b, 23a, 23b having an individual space; the air injection means is comprised of right/left air pumps 31a, 31b each connected to the right/left air bag 20a, 20b for supplying the air into the front/rear cells 22a, 22b, 23a, 23b, right/left direction control valves 32a, 32b for supplying air to all air bags 20a, 20b or a selective one, right/left air pressure sensors 38a, 38b for detecting the pressure of the air fed into the right/left direction control valves 32a, 32b from the right/left air pumps 31a, 31b, right/left front/rear air discharge valves 33a, 33b, 34a, 34b for discharging the air from the front/rear cells 22a, 22b, 23a, 23b, controller 35 for controlling the air pumps 31a, 31b, direction control valves 32a, 32b and air discharge valves 33a, 33b, 34a, 34b, a display panel 36 for displaying a signal generated from the controller 35, and a control panel 37 having a plurality of operating keys for inputting the signal generated by a pushed key into the controller 35.

10. The pelvis remedial seated device as set forth in claim 9, wherein the seat cushion 11 has further a photo detective sensor 39, and during no occupant's seating, the photo detective sensor senses the light and the running of the remedial seated device is stopped by the command of the controller 35.

5

11. The pelvis remedial seated device as set forth in claim 9, wherein the seat cushion 11 has further a far-infrared generator "I" controlled by the command of the controller 35 at the contacting portion with an occupant's hip, by which the far-infrared light is applied to a pelvis muscle.

10

12. The pelvis remedial seated device as set forth in claim 9, wherein the seat cushion 11 has further an oscillating motor "M" and a low frequency oscillator "F" which are under a control of the controller 35 so as to stimulate an occupant's hip.

15

13. The pelvis remedial seated device as set forth in any one of claims 9 to 12, wherein the seat 10 has a hollow formed by plural partitions 14 in a round edge belt 13, and the hollow accommodates the air injection means, the photo detective sensor 39, the far-infrared generator "I", the oscillating motor "M" and the low frequency oscillator "F".

20

14. The pelvis remedial seated device as set forth in claim 9, wherein the display panel 36 is comprised of a timer unit 36a for indicating the running duration of the remedial device, a level indicating unit 36b for displaying the level of a chosen function and a function indicating unit for displaying which function an occupant chooses.

25

15. The pelvis remedial seated device as set forth in claim 9, wherein the control panel 37 is comprised of plural function key pads 37a for selecting an adaptable function such as massage, beat or fumble with pressing, a pair of level key pads 37b for setting the level of a function chosen, plural mode key pads 37c for

30



choosing various mode, a time set key pad 37d for setting duration of the chosen function or the mode and a power key pad 37e for turning on/off power.

5           16. A method for controlling a pelvis remedial seated device, the method comprising the steps of:

          (A) inputting a value of a press level chosen by an occupant through a control panel 37;

          (B) supplying the air into right/left air bags 20a, 20b by operation of right/left air pumps 31a, 31b;

10           (C) supplying the air into left front/rear cells 22a, 22b and right front/rear cells 23a, 23b under the control of right/left direction control valves 32a, 32b;

          (D) detecting the air pressure in right/left air bags 20a, 20b by right/left air pressure sensors 38a, 38b, determining whether a detected air pressure is lower than a value inputted by an occupant, returning to step (B) if it is, or stopping a running  
15 of the air pumps 31a, 31b for predetermined period if it is not;

          (E) discharging the air through opened right/left front/rear air discharge valves 33a, 33b, 34a, 34b until the air pressure of the air bags 20a, 20b is lower than a discharge pressure; and,

          (F) stopping the running of the air pumps 31a, 31b for predetermined period  
20 when the air pressure of the air bags 20a, 20b is lower than a discharge pressure, comparing between the present time elapsed from step (A) and the predetermined set time, returning to step (B) if the present time has not passed, or going a stop step if it has.

25           17. The method for controlling a pelvis remedial seated device as set forth in claim 16, wherein if the air pressure detected in the air bags 20a, 20b is larger than the value inputted by an occupant, the operation of the air bags 20a, 20b is stopped approximately 10 seconds.

30           18. A method for controlling a pelvis remedial seated device, the method comprising the steps of:

(A) inputting a value of a press level chosen and a type of crook remedy by an occupant through a control panel 37;

(B) supplying the air into right/left air bags 20a, 20b by operation of right/left air pumps 31a, 31b;

5 (C) supplying the air into left front/rear cells 22a, 22b and right front/rear cells 23a, 23b under the control of right/left direction control valves 32a, 32b;

(D) detecting the air pressure in right/left air bags 20a, 20b by right/left air pressure sensors 38a, 38b, determining whether a detected air pressure is lower than a value inputted by an occupant, returning to step (B) if it is, or determining whether  
10 its next step is a right crook remedy or a left crook remedy if it is not;

(E) discharging the air through a left/rear air discharge valve 34b and a right/front air discharge valve 33a until the air pressure of a left/rear cell 23b and a right/front cell 22a is the appropriated one to support an occupant's pelvis when the left crook remedy;

15 (F) determining whether the air pressure of the left rear cell 23b and the right/front cell 22a is lower than a discharge one, returning to step (E) if it is not, stopping the running of the air pumps 31a, 31b for predetermined period if it is;

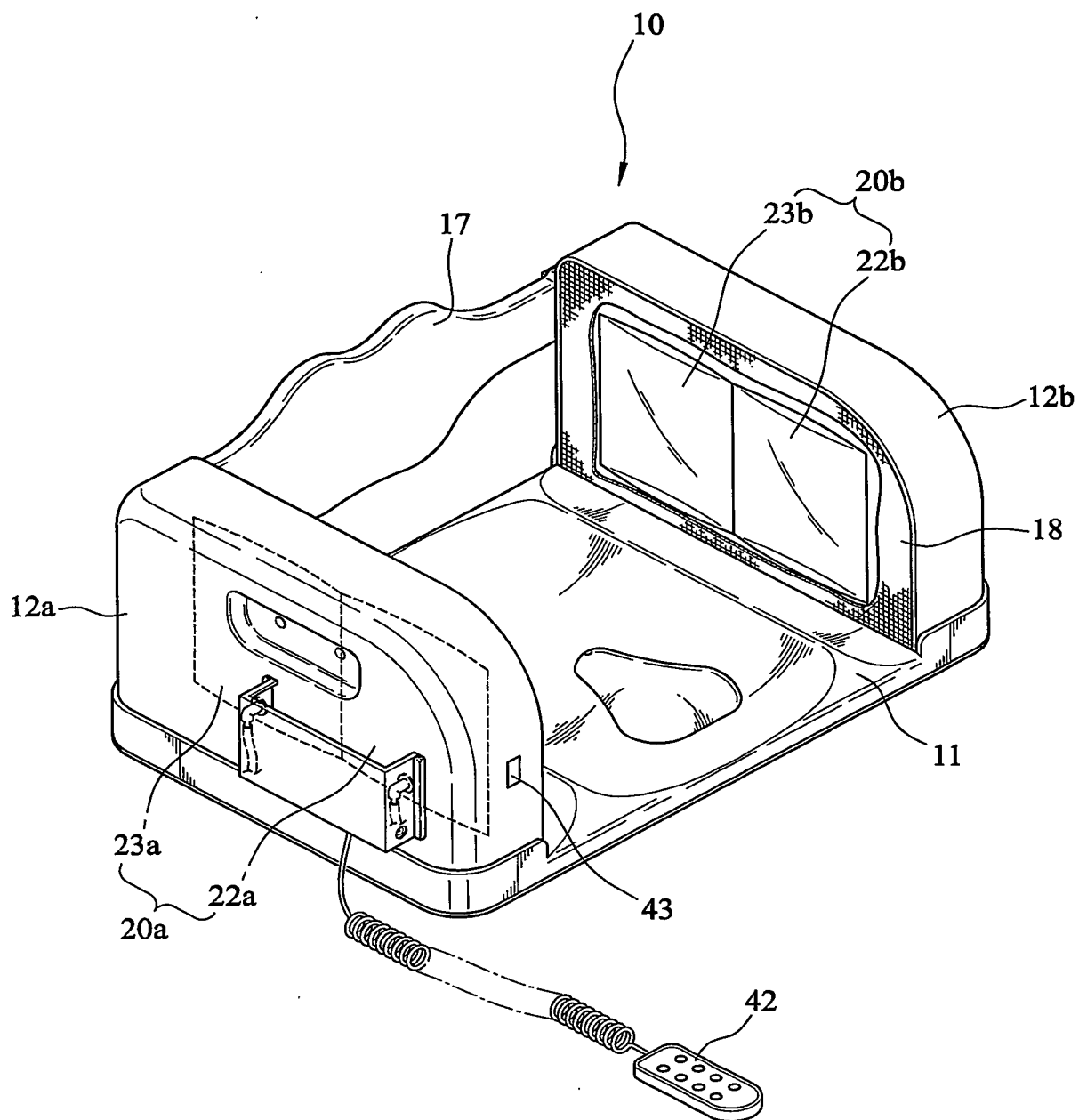
(G) comparing between the present time elapsed from step (A) and the predetermined set time, returning to step (B) if the present time has not passed, or  
20 going a stop step if it has;

(H) discharging the air through a left/front air discharge valve 33b and a right/rear air discharge valve 34a until the air pressure of a left/front cell 22b and a right/rear cell 23a is the appropriated one to support an occupant's pelvis when the left crook remedy at step (D); and,

25 (I) determining whether the air pressure of the left/front cell 22b and the right/rear cell 23a is lower than a discharge one, returning to step (H) if it is, stopping the running of the air pumps 31a, 31b for predetermined period if it is not, and comparing between the present time elapsed from step (A) and the predetermined set time, returning to step (B) if the present time has not passed, or  
30 going a stop step if it has.

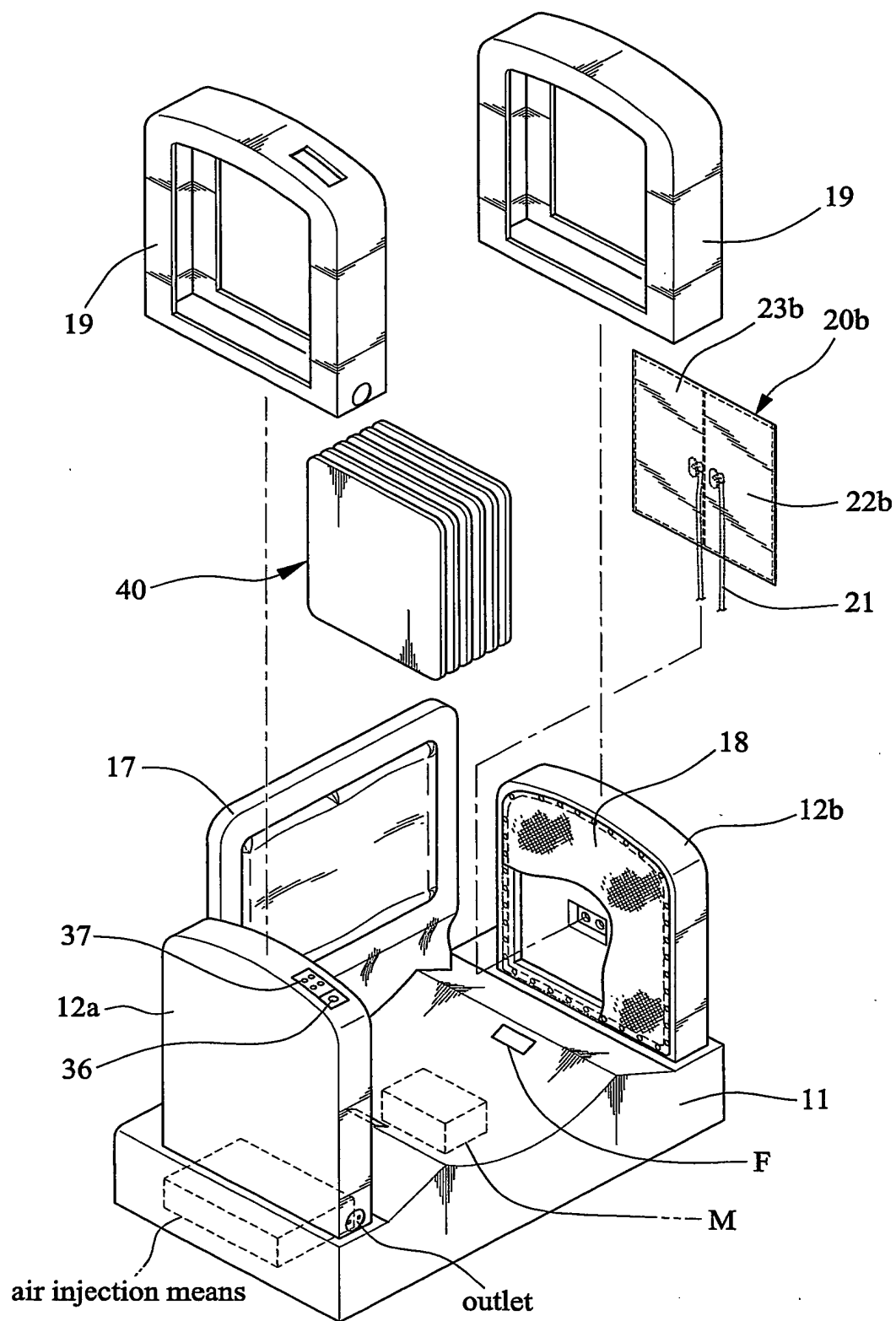
1 / 14

FIG. 1A



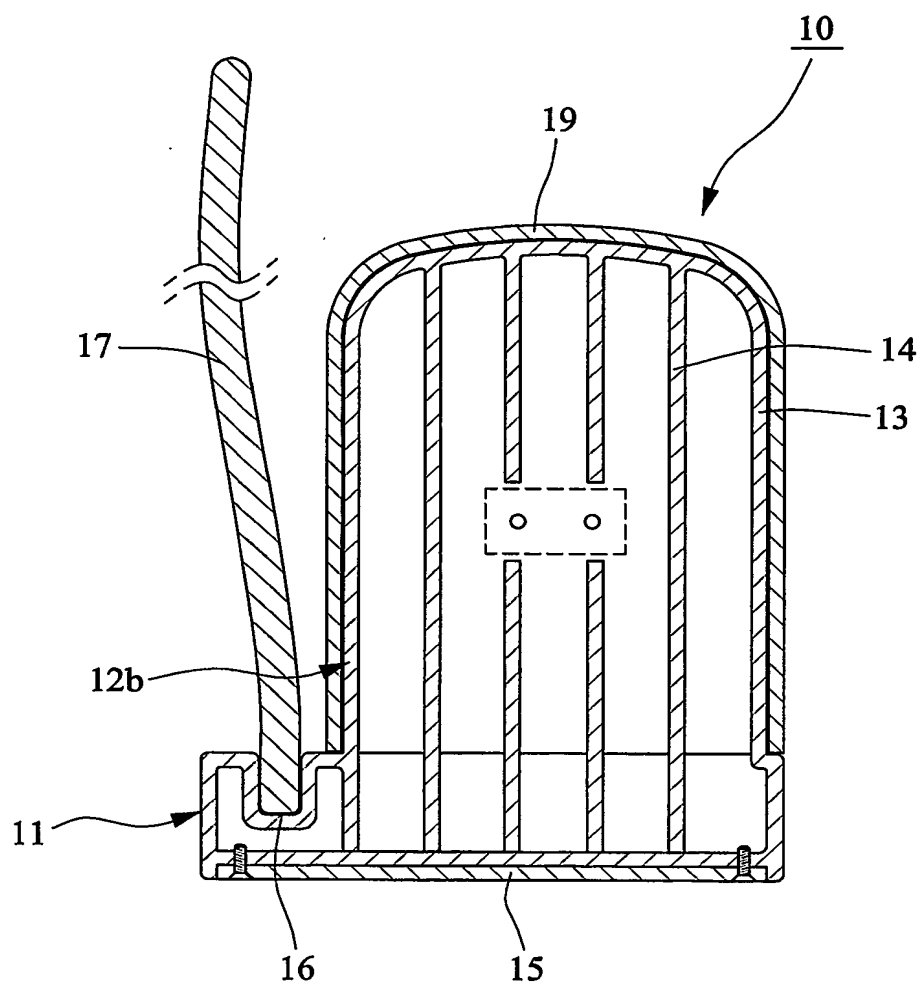
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FIG. 1B



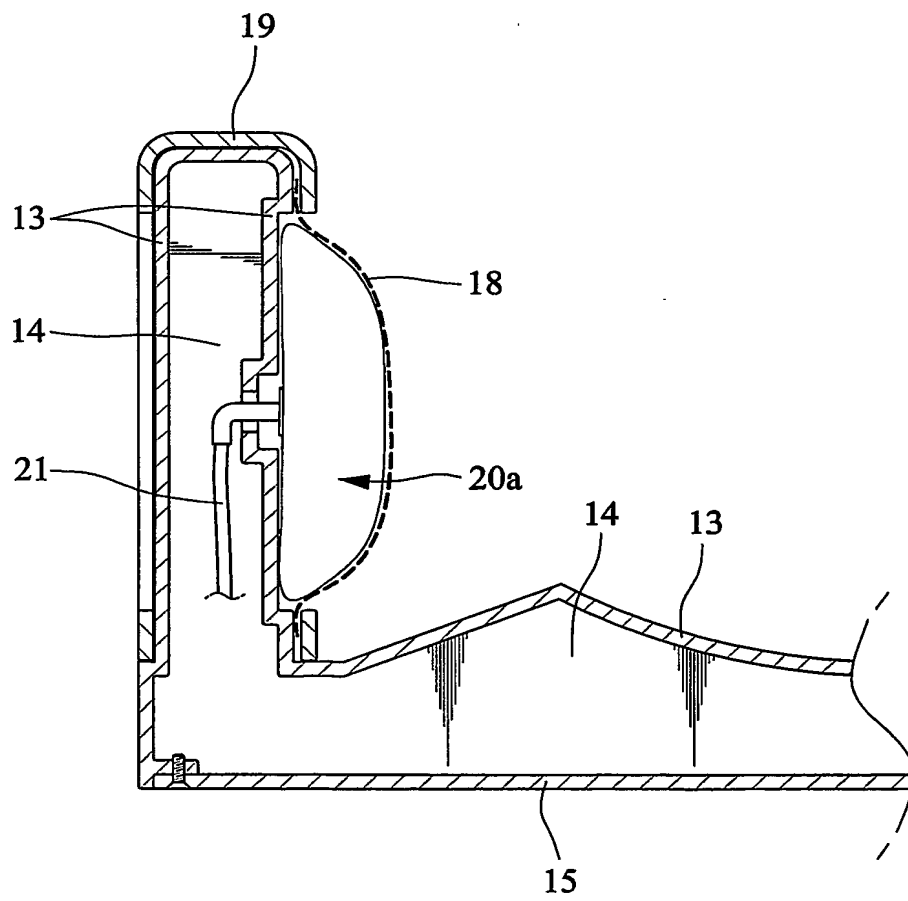
3 / 14

FIG. 2



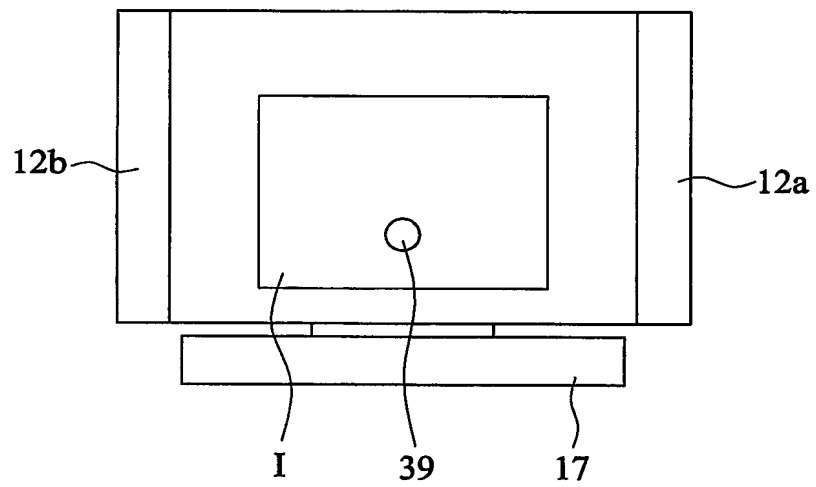
4 / 14

FIG. 3



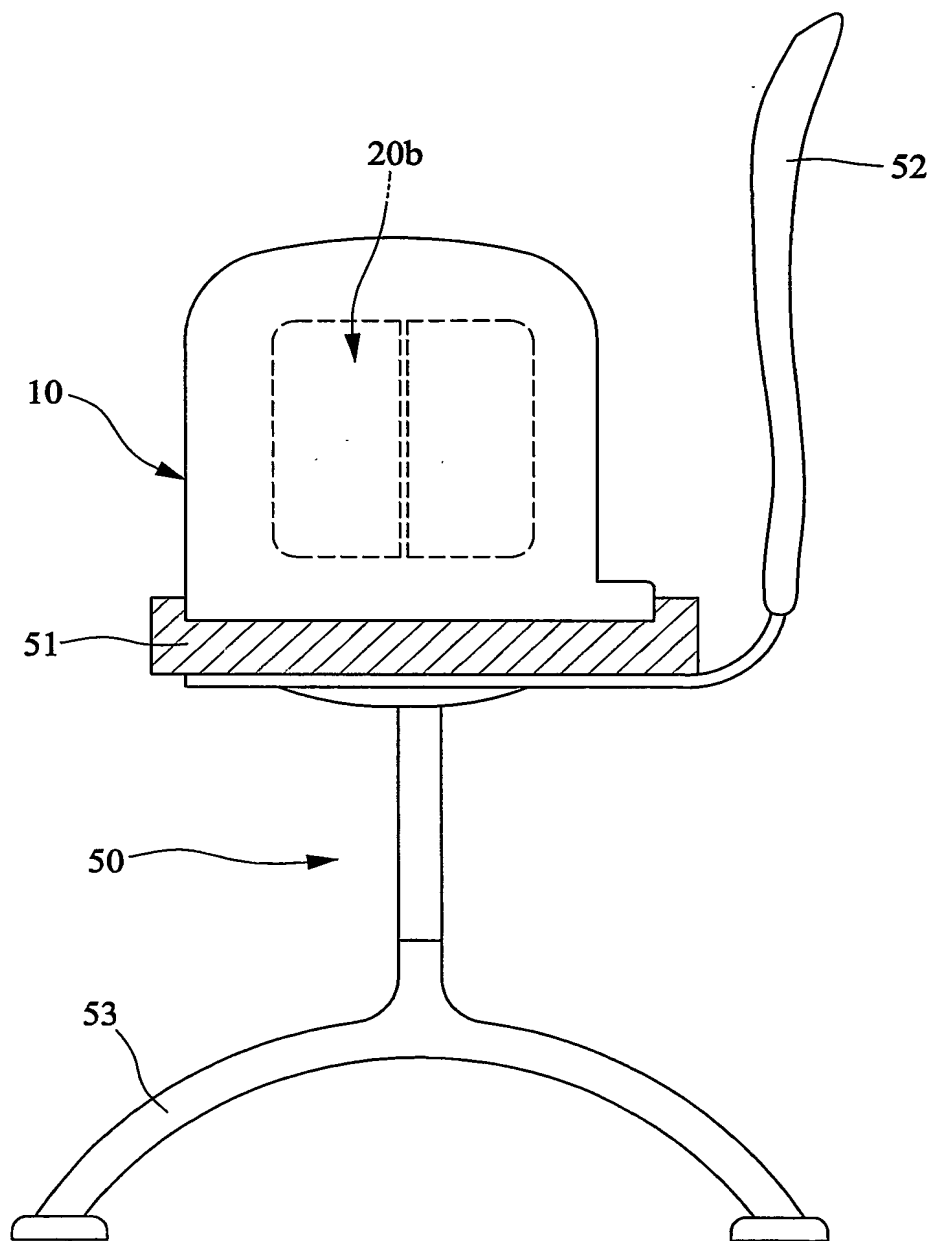
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FIG. 4



6 / 14

FIG. 5





7 / 14

FIG. 6

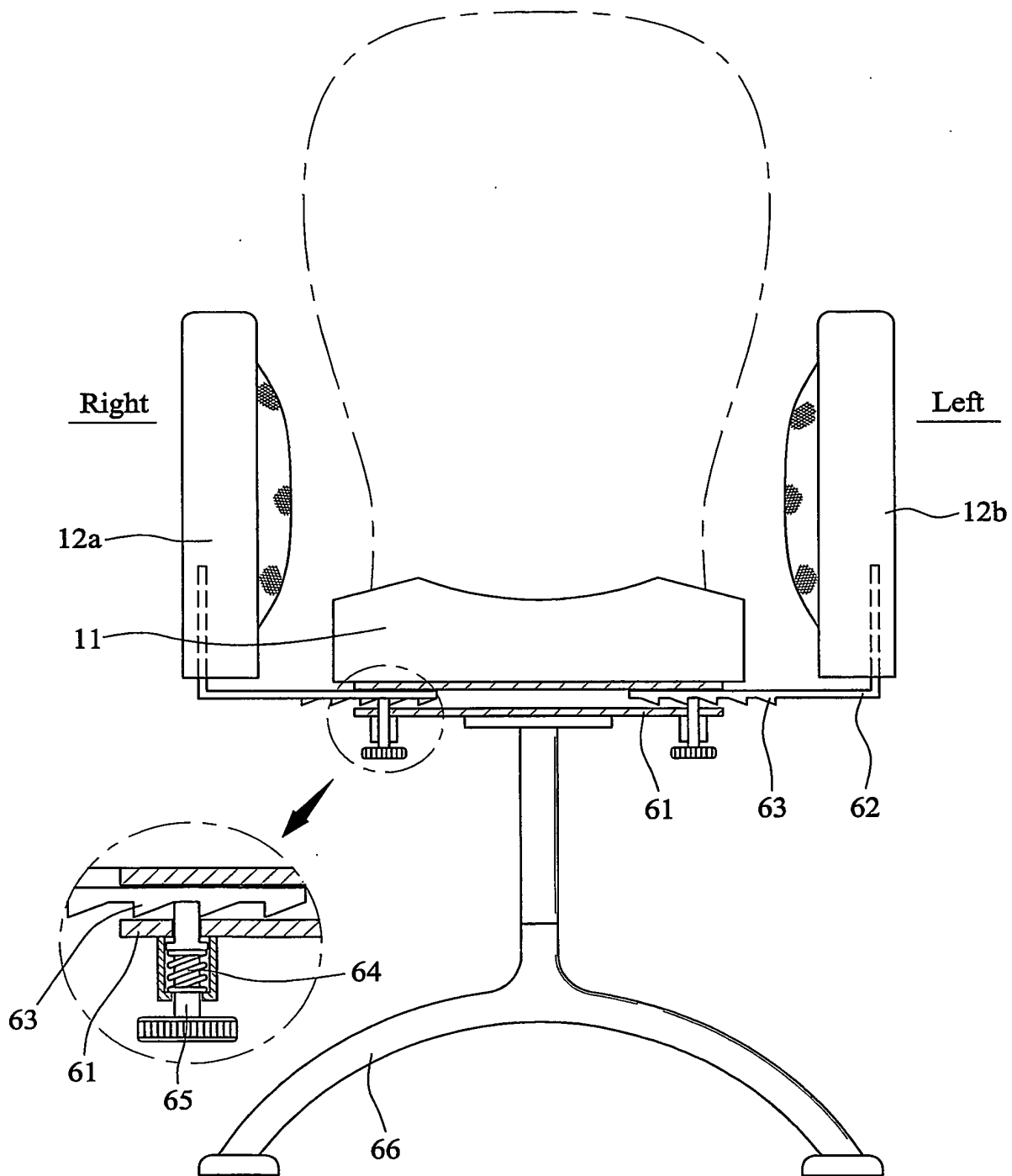
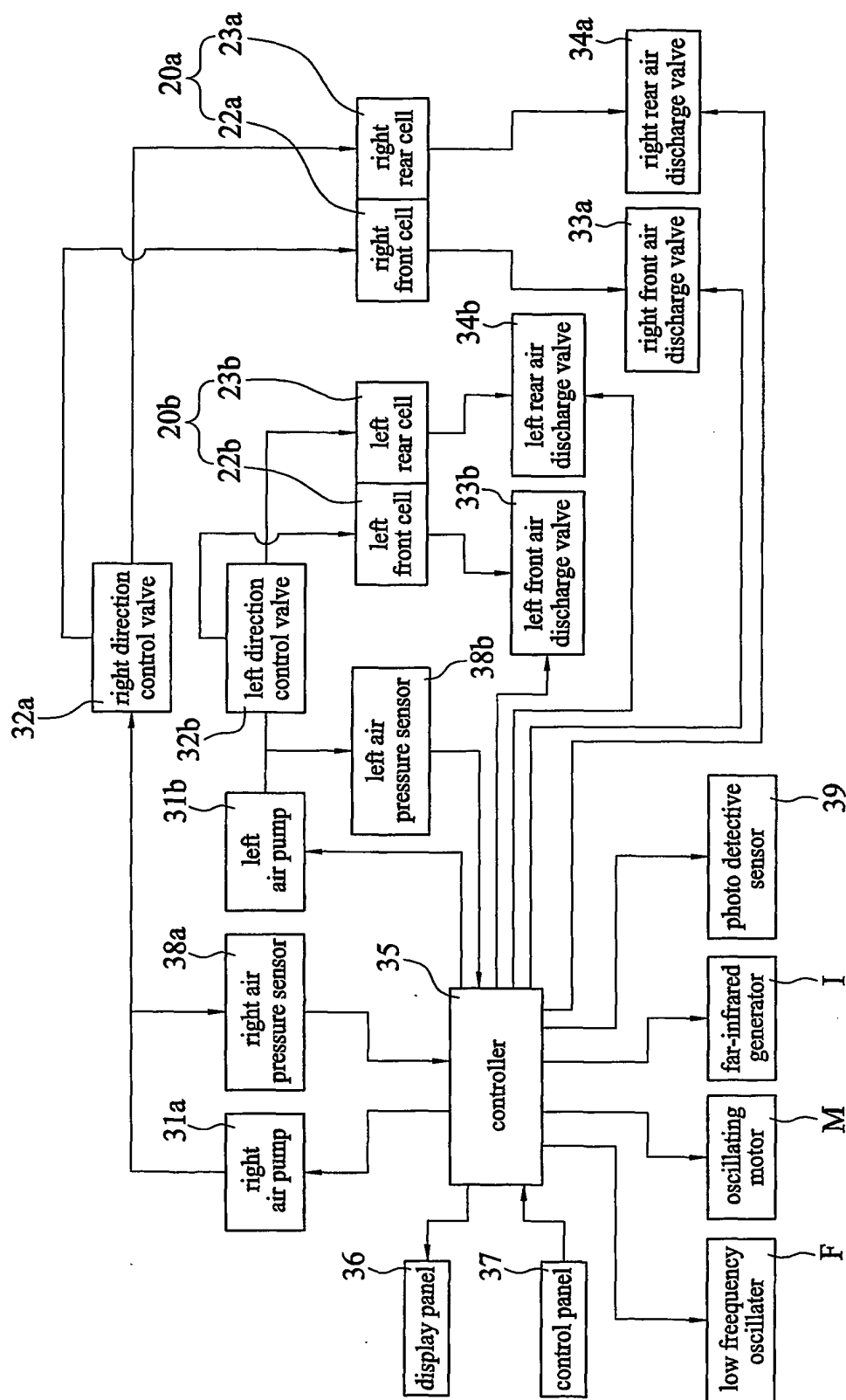


FIG. 7



9 / 14

FIG. 8A

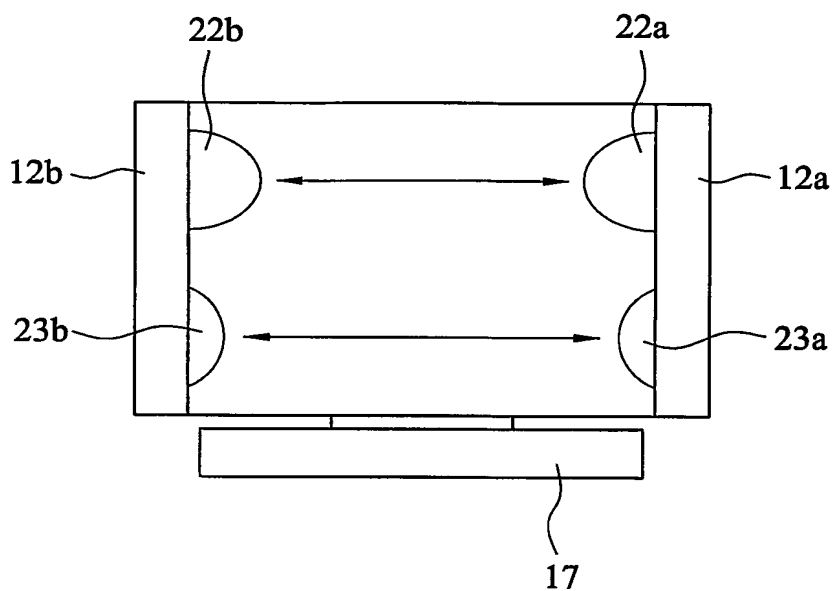
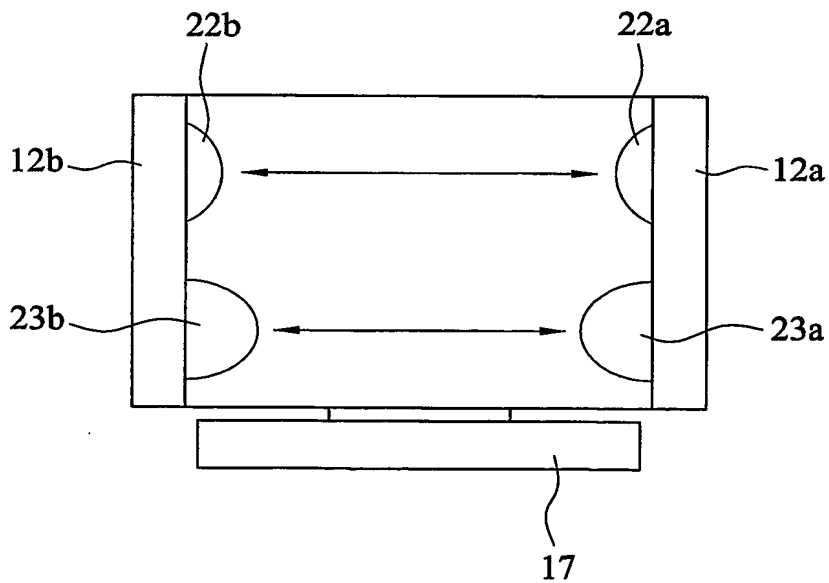


FIG. 8B



10 / 14

FIG. 9

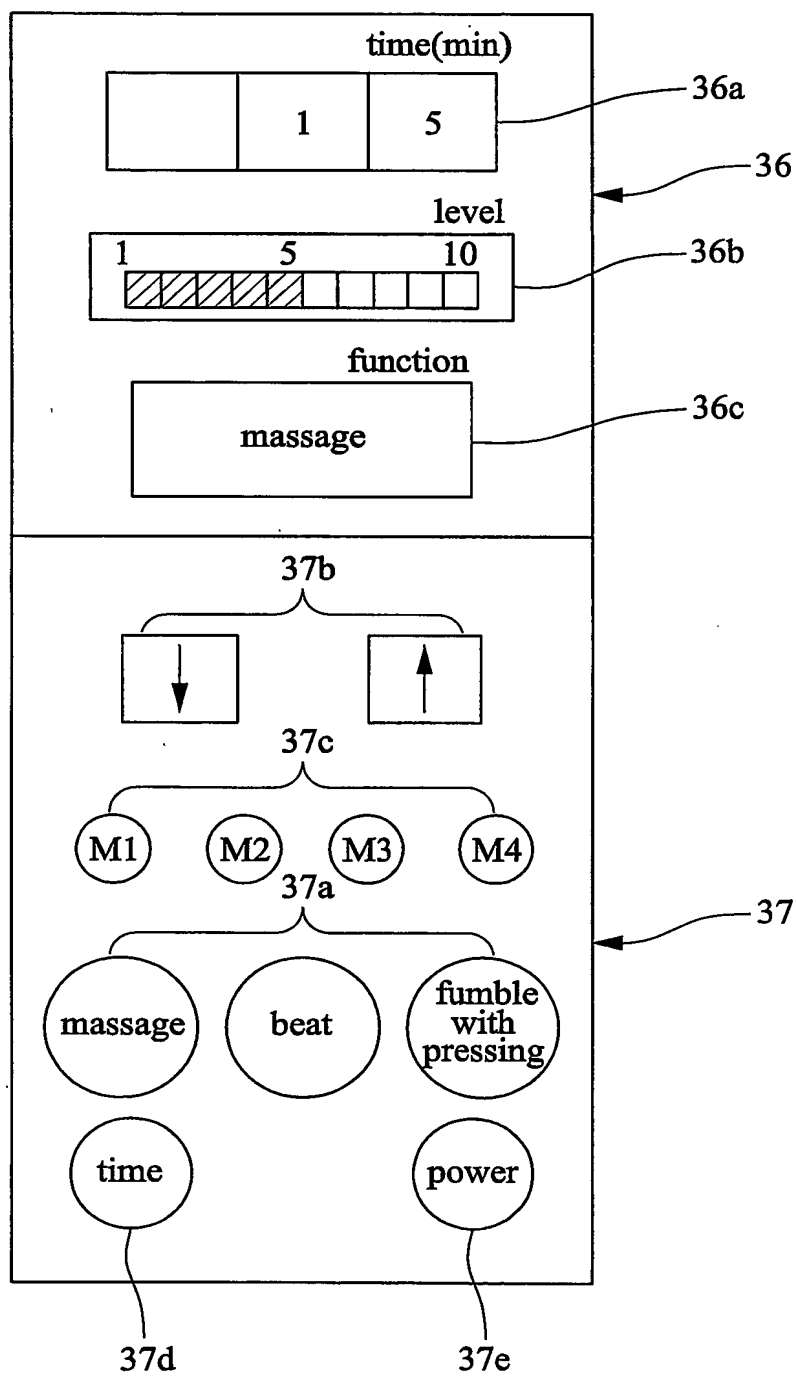
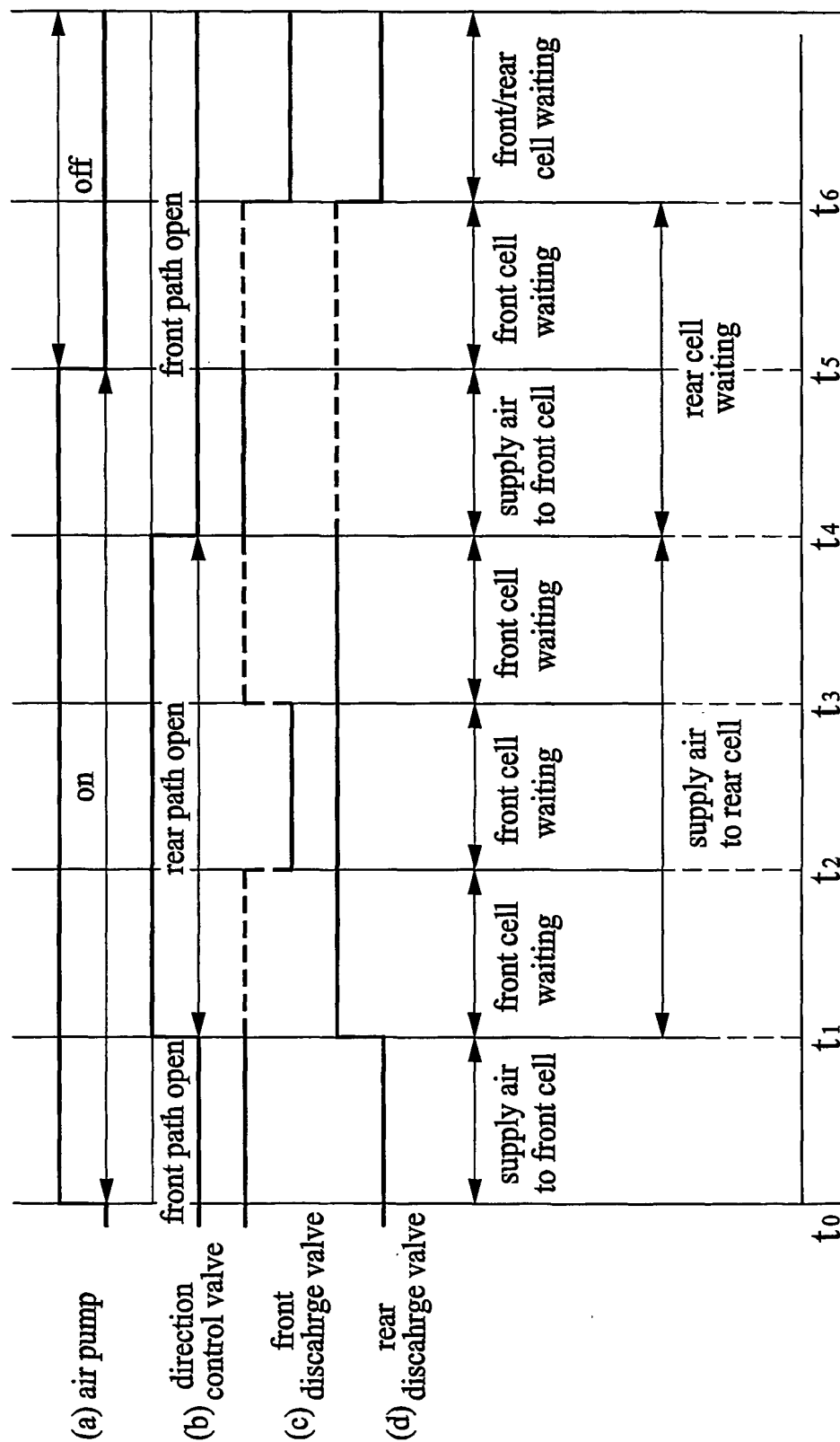
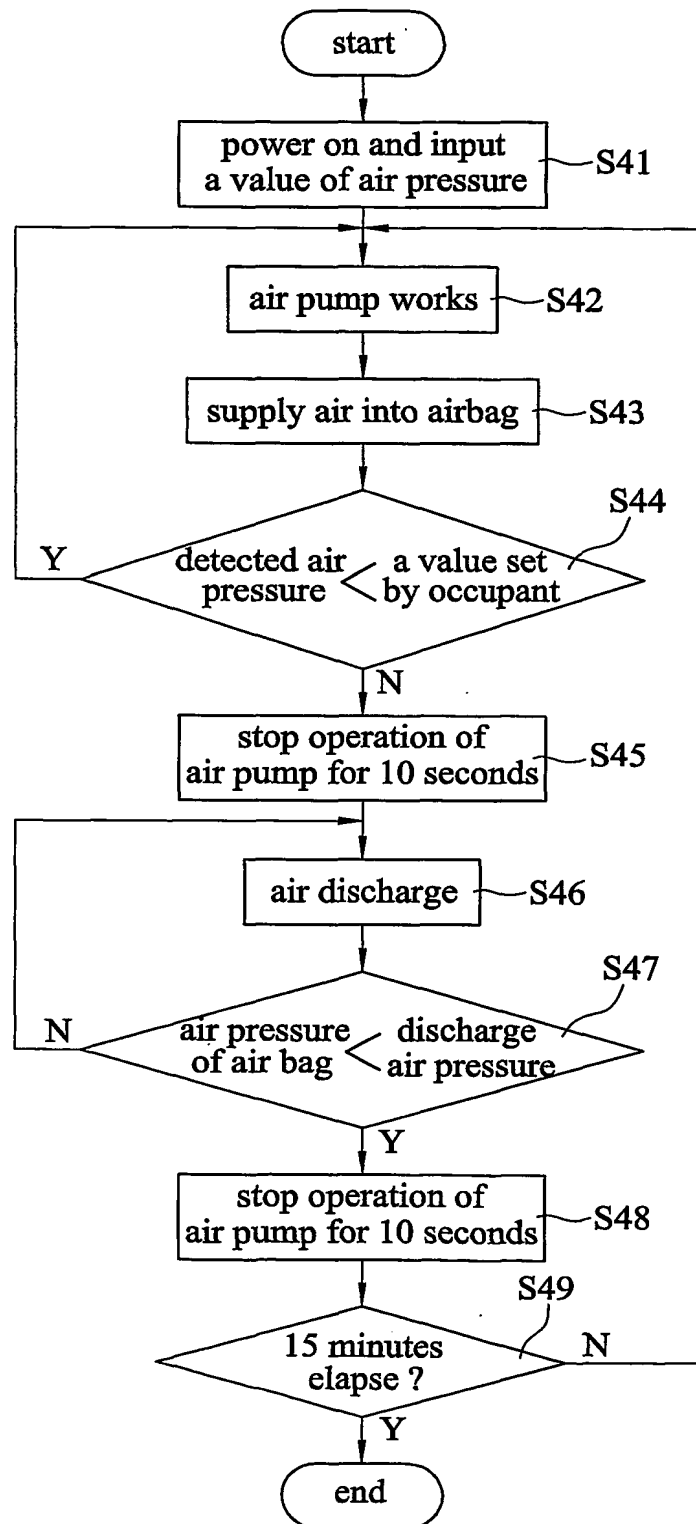


FIG. 10



12 / 14

FIG. 11



13 / 14

FIG. 12A

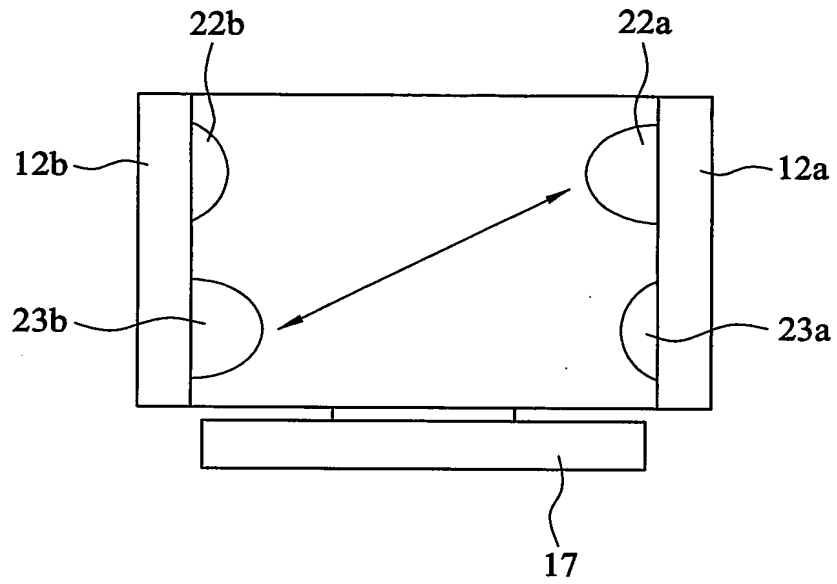
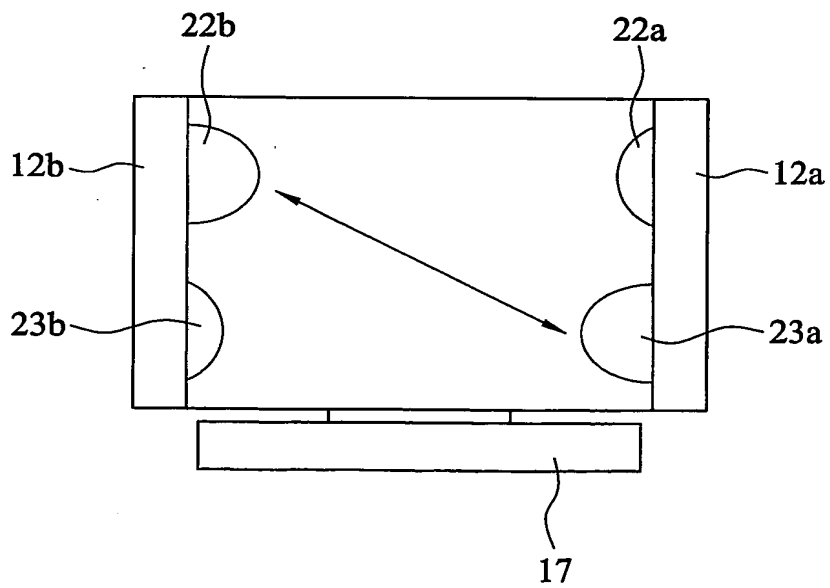
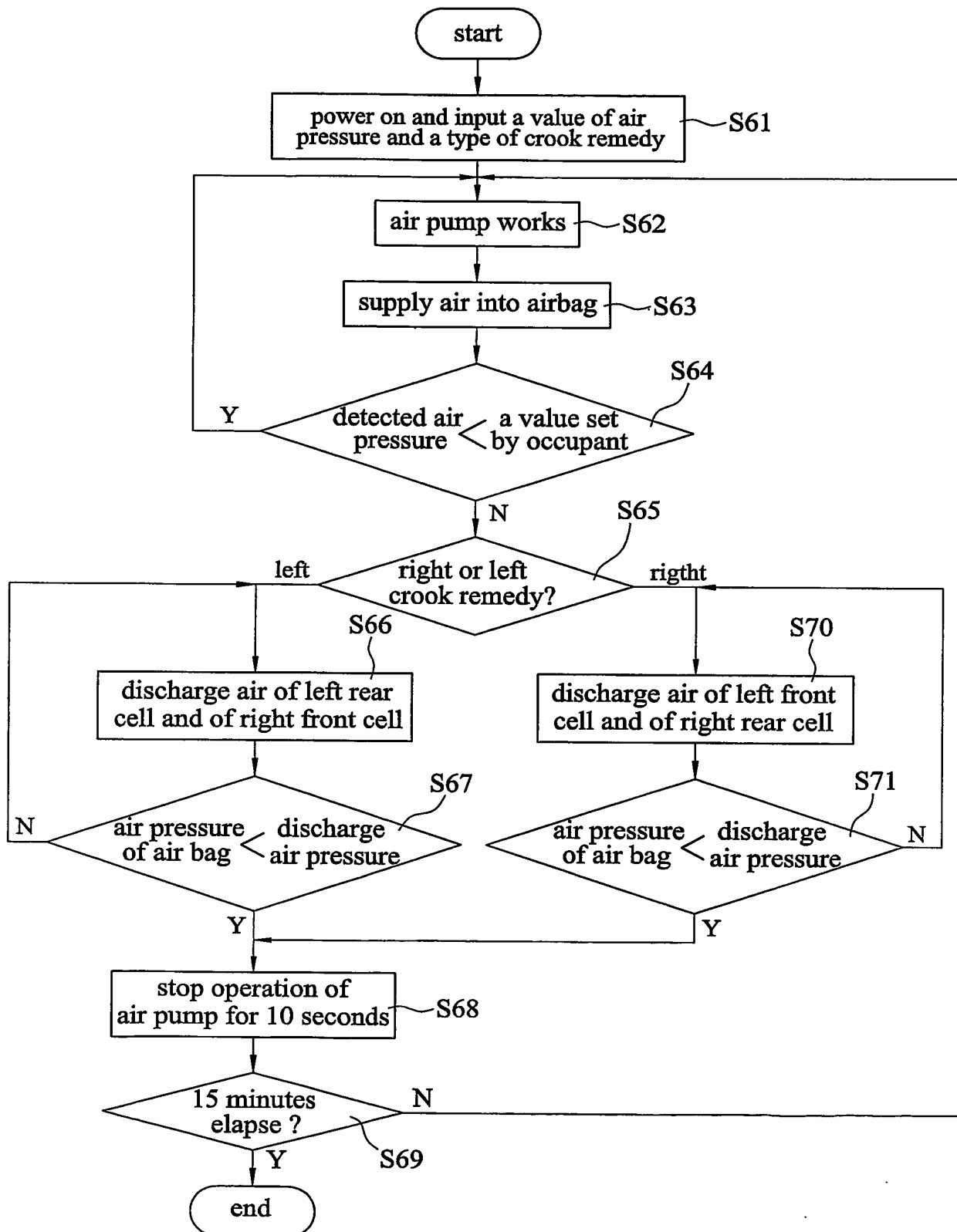


FIG. 12B



14 / 14

FIG. 13





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(74) Agent: CHOI, Jong Won; 5th Fl., Shinwon Bldg., 648-15  
Yeoksam-dong, Gangnam-gu, Seoul 135-911 (KR).

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(71) Applicant and

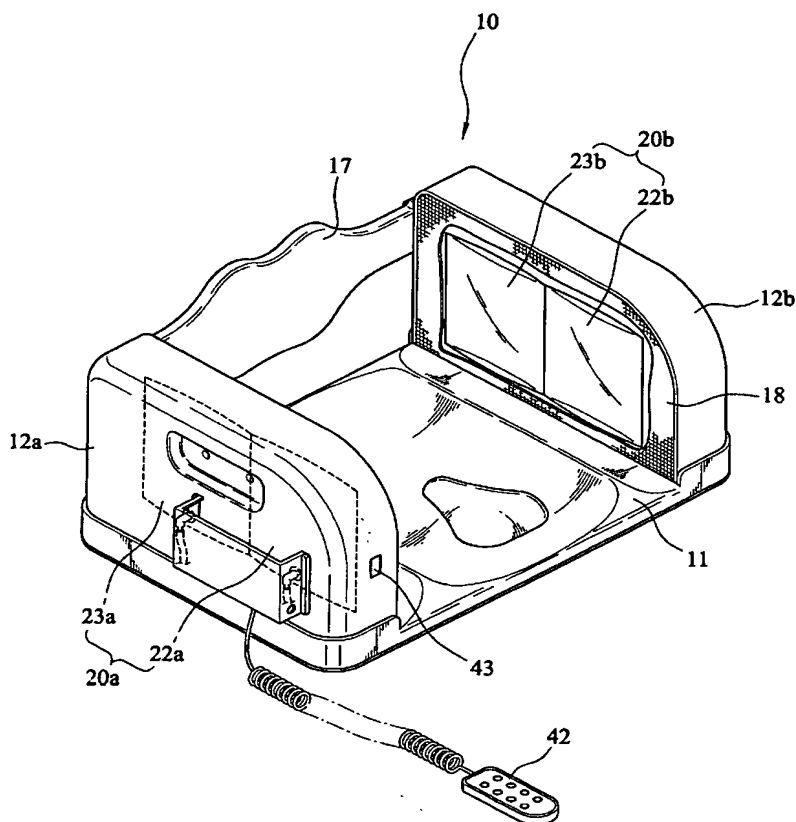
(72) Inventor: HA, Jeon Ho [KR/KR]; 202-304 Dongsin 2nd  
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buk 560-251 (KR).

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[Continued on next page]

(54) Title: PELVIS REMEDIAL SEATED DEVICE AND CONTROL METHOD THEREOF



(57) Abstract: The present invention relates to a pelvis remedial seated device and a control method thereof for remedying into its original place a women's widened pelvis after child birth. The pelvis remedial seated device is comprised of a seat (10) included a seat cushion (11) on which an occupant is to be seated and left/right seat sides (12a, 12b) provided uprightly at each side end of the seat cushion (11); a pair of air bags (20a, 20b) nested on an inner side of each side for enabling themselves to be expanded or contracted by air supplied into or discharged from the inside of the air bag; and air injection means for providing air pressure to the air bags (20a, 20b); wherein the expanding air pressure in the air bags presses the pelvis portion of an occupant. According to the present invention, the air pressure can artificially press the pelvis portion of the woman with seated or lying down relaxedly without constraining the human body so that rapid the pelvis remedy can be attained.



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# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/KR2003/001718

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: A61H 1/00, 15/00, 23/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: A61H 1/00, 15/00, 23/04 // A47C 27/08, 27/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 155 685 A (KISHI Y. et al.) 13 October 1992 (13.10.1992) <i>the whole document, especially abstract, figure 2, column 2, line 61-64, column 3, line 1-12, column 4, line 35-42, column 5, line 46-50, claims 1-3, 18, 19.</i>	1
A		2, 3, 9, 15, 16, 18
X	WO 2001/000132 A1 (McCORMACK WINN TEXTRON) 4 January 2001 (04.01.2001) <i>the whole document, especially abstract, figures 1,3, page 6, line 22 - page 7, line 14, claims 1, 2, 6-8.</i>	1
A		2, 3, 9, 15, 16, 18
A	JP 10 118143 A (FUJII IRYOKI KK) 12 May 1998 (12.05.1998) <i>the whole document, especially figure 1-7.</i>	1
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☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

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„&“ document member of the same patent family

Date of the actual completion of the international search

30 January 2004 (30.01.2004)

Date of mailing of the international search report

3 January 2005 (03.01.2005)

Name and mailing address of the ISA/AT

Austrian Patent Office

Dresdner Straße 87, A-1200 Vienna

Facsimile No. 1/53424/535

Authorized officer

LUDWIG H.

Telephone No. 1/53424/340

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 2003/001718

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
JP	A	10118143 A2		none			
US	A	5155685	1992-10-13	DE	A	4022433	1991-01-24
				JP	A	3047206	1991-02-28

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